

CLAIMS

1. A self adjusting hydrocephalus valve for regulating cerebrospinal fluid in a patient, comprising:

a housing enclosing therein a chamber that is able to permit fluid flow therethrough, an inlet port in fluid communication with the chamber to accommodate passage of fluid into the chamber, and an outlet port in fluid communication with the chamber to accommodate passage of fluid out of the chamber; and

a valve mechanism disposed within the housing for regulating the rate of fluid flow through the chamber, the valve mechanism including a valve seat adjacent to an opening in the inlet port, a blocking member configured to seat in the valve seat, and a biasing element for exerting a biasing force against the blocking member to selectively maintain the blocking member against the valve seat and prevent fluid flow therethrough, the biasing element being configured to respond to a pressure difference within the valve;

wherein the biasing element has an adjustable resistance to allow fluid release at a rate which is proportional to an average pressure difference over time.

2. The valve of claim 1, wherein the biasing element is connected to the blocking member.

3. The valve of claim 1, wherein the biasing element comprises a spring element.

4. The valve of claim 1, wherein the biasing element comprises at least one flexible bellows defined by a base plate, an opposed end plate, and a collapsible side wall extending therebetween.

5. The valve of claim 4, wherein the biasing element comprises a single flexible bellows.

6. The valve of claim 5, wherein the end plate connects to a support member for securing the biasing element to the housing.

7. The valve of claim 5, wherein the support member includes apertures permitting fluid flow therethrough.
8. The valve of claim 4, wherein the at least one flexible bellows is formed from a biocompatible elastomeric material.
9. The valve of claim 5, wherein the end plate of the single flexible bellows includes an orifice to provide fluid communication between the single flexible bellows and the chamber.
10. The valve of claim 4, wherein the biasing element comprises two flexible bellows, the first flexible bellows being connected in parallel to the second flexible bellows.
11. The valve of claim 10, wherein the first and second bellows are connected by an orifice such that the first flexible bellows is in fluid communication with the second flexible bellows.
12. The valve of claim 11, further including a support member extending between the first and second flexible bellows for securing the biasing element to the housing.
13. The valve of claim 11, wherein the support member includes apertures permitting fluid flow therethrough.
14. The valve of claim 13, wherein the first and second bellows form a closed fluidic system.
15. The valve of claim 13, wherein the first flexible bellows is connected to the blocking member.
16. The valve of claim 13, wherein the first and second flexible bellows are formed from a biocompatible elastomeric material.
17. The valve of claim 13, wherein the biasing element is at least partially filled with a fluid.
18. The valve of claim 17, wherein the fluid is an inert gas.

19. The valve of claim 1, wherein the blocking member is a spherical ball.
20. The valve of claim 24, wherein the valve seat has a spherical surface for mating with a portion of an outer surface of the spherical ball.